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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/730,452 | 12/05/2000 | Paulus Thomas Maria van Zeijl | 29206-00027 | 8130 |

7590 07/11/2005

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|---|---|
| MILLER, BRANDON J | |
| **ART UNIT** | **PAPER NUMBER** |
| 2683 | |

DATE MAILED: 07/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

| Office Action Summary | Application No. | Applicant(s) |
|---|---|---|
| | 09/730,452 | MARIA VAN ZEIJL, PAULUS THOMAS |
| | **Examiner** | **Art Unit** |
| | Brandon J. Miller | 2683 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *26 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-6,8-36 and 38-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-36 and 38-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 6, 9-15, 17, 21-23, 25-26, 28-36, and 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ripley in view of Liu.

Regarding claim 1 Ripley teaches an image reject circuit with a local oscillator for producing a local oscillator signal (see col. 5, line 21-22). Ripley teaches a tunable phase shifting network for receiving a local oscillator signal and producing an output in-phase signal (I) and an output quadrature (Q) signal (see col. 5, lines 23-26). Ripley teaches a phase detector for determining the phase of the output I signal and a phase detector for determining the phase of the output Q signal (see col. 3, lines 30-32 and col. 5, lines 27-30). Ripley teaches determining the difference between the phase of the output I and Q signals, to produce a tuning signal for tuning the phase shifting network to bring the difference between the phases of the output I and Q signals towards a desired level (see col. 3, lines 32-37). Ripley does not teach an amplitude detector for determining the amplitude of the output I signal and an amplitude detector for determining the amplitude of the output Q signal, or determining the difference between the amplitude of the output I and Q signals to bring the difference between the amplitudes of the

output I and Q signals towards a desired level. Liu teaches an amplitude detector for determining the amplitude of the output I signal and an amplitude detector for determining the amplitude of the output Q signal, and determining the difference between the amplitude of the output I and Q signals to bring the difference between the amplitudes of the output I and Q signals towards a desired level (see abstract and col. 10, lines 19-35 and 37-49). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the invention adapt to include an amplitude detector for determining the amplitude of the output I signal and an amplitude detector for determining the amplitude of the output Q signal, and determining the difference between the amplitude of the output I and Q signals to bring the difference between the amplitudes of the output I and Q signals towards a desired level because this would allow for efficient adjustment of input signals provided for reducing the image response of the receiver.

Regarding claim 2 Ripley teaches a phase shifting network that has first and second input terminals for receiving the local oscillator signal (see col. 5, lines 34-38). Ripley teaches a first phase shifting circuit connected between a first input terminal and a voltage reference and a second phase shifting circuit connected between a voltage reference and a second input terminal (see col. 3, lines 24-26, 45-47 & 51-53). Ripley teaches a first and second pairs of complementary output lines connected to each of the first and second phase shifting circuits; and, a tuning input for receiving a tuning signal (see col. 5, lines 23-38).

Regarding claim 3 Ripley teaches each of a first and second phase shifting circuits comprises a bridge circuit, with each bridge circuit containing a first parallel arm and second parallel arm connected between the respective input terminal and the voltage reference; the first

parallel arm comprising a resistive element connected in series with a capacitive element; the second parallel arm comprising a capacitive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and capacitive element (see col. 3, lines 11-21 & 46-50).

Regarding claim 4 Ripley teaches a tunable phase shifting network that is tuned by adjusting an RC time constant (see col. 4, lines 37-42).

Regarding claim 6 Ripley teaches a resistive element that comprises a variable resistor, which is tuned in accordance with a tuning signal (see col. 3, lines 15-16).

Regarding claim 9 Ripley teaches each of a first and second phase shifting circuit comprises a first and second bridge circuit, with each bridge circuit containing a first and second parallel arms connected between the respective input terminal and the voltage reference; the first arm comprising a resistive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and capacitive element (see col. 3, lines 11-21 & 46-50). Ripley does not teach the first arm comprising a resistive element connected in series with an inductive element; the second arm comprising an inductive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and inductive element, or a phase shifting network that is tuned by adjusting the RL time constant. Ripley does teach adjusting an RC time constant (see col. 4, lines 37-42) and changing resistive and capacitive elements (see col. 3, lines 18-21 and col. 5, lines 15-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the

invention adapt to include the first arm comprising a resistive element connected in series with an inductive element; the second arm comprising an inductive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and inductive element, and a phase shifting network that is tuned by adjusting the RL time constant because this would allow improved image rejection capabilities of a phasing receiver.

Regarding claim 10 Ripley teaches each of a first and second phase shifting circuits comprises a bridge circuit, with each of the first and second bridge circuit containing a first and second parallel arms connected between the respective input terminal and the voltage reference; the first arm comprising a resistive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and capacitive element (see col. 3, lines 11-21 & 46-50). Ripley does not teach the first arm comprising an inductive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with an inductive element; and, each I and Q output line being connected to a respective junction between the series connected inductive element and capacitive element, or a phase shifting network that is tuned by adjusting the LC time constant. Ripley does teach adjusting an RC time constant (see col. 4, lines 37-42) and changing resistive and capacitive elements (see col. 3, lines 18-21 and col. 5, lines 15-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the invention adapt to include the first arm comprising an inductive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in

series with an inductive element; and, each I and Q output line being connected to a respective junction between the series connected inductive element and capacitive element, and a phase shifting network that is tuned by adjusting the LC time constant because this would allow improved image rejection capabilities of a phasing receiver.

Regarding claim 12 Liu teaches two-stage amplitude detection (see col. abstract and col. 10, lines 29-35).

Regarding claim 13 Liu teaches amplitude detectors that include quadratic function circuits (see abstract and col. 4, lines 13-14).

Regarding claim 14 Ripley and Liu teach a device as recited in claim 1 except for a desired difference between the amplitudes of the output I and Q signals that is substantially zero. Liu does teach a desired difference between the amplitudes of the output I and Q signals (see col. 10, lines 30-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include a desired difference between the amplitudes of the output I and Q signals that is substantially zero because this would allow for adjustment of phase and/or amplitude of input signals provided for improving image rejection.

Regarding claim 15 Liu teaches removing any residual difference between the amplitudes for the I and Q signals (see col. 4, lines 34-38).

Regarding claim 17 Ripley and Liu teach a device as recited in claim 1 except for a desired difference between amplitudes of the output I and Q signals that is set to a predetermined level, to compensate for amplitude error. Liu does teach a desired difference between amplitudes of the output I and Q signals that is set, to compensate for amplitude error (see col. 4, lines 22-28, 30-32, & 36-38). It would have been obvious to one of ordinary skill in the art at the time the

invention was made to make the device adapt to include a desired difference between amplitudes of the output I and Q signals that is set to a predetermined level, to compensate for amplitude error because this would allow for adjustment of phase and/or amplitude of input signals provided for improving image rejection.

Regarding claim 21 Ripley teaches a second tunable phase shifting network located in an intermediate frequency path, the tuning signal of the first phase shifting network also being used to tune the second phase shifting network (see col. 2, lines 19-25 and FIG. 1).

Regarding claim 22 Ripley teaches an image reject circuit with a local oscillator for producing a local oscillator signal (see col. 5, line 21-22). Ripley teaches a tunable phase shifting network for receiving a local oscillator signal and producing an output in-phase signal (I) and an output quadrature (Q) signal (see col. 5, lines 23-26). Ripley teaches a phase detector for determining the phase of the output I signal and a phase detector for determining the phase of the output Q signal (see col. 3, lines 30-32 and col. 5, lines 27-30). Ripley teaches determining the difference between the phase of the output I and Q signals, to produce a tuning signal for tuning the phase shifting network to bring the difference between the phases of the output I and Q signals towards a desired level (see col. 3, lines 32-37). Ripley does not teach an amplitude detector for determining the amplitude of the output I signal and an amplitude detector for determining the amplitude of the output Q signal, or determining the difference between the amplitude of the output I and Q signals to bring the difference between the amplitudes of the output I and Q signals towards a desired level. Liu teaches an amplitude detector for determining the amplitude of the output I signal and an amplitude detector for determining the amplitude of the output Q signal, and determining the difference between the amplitude of the

output I and Q signals to bring the difference between the amplitudes of the output I and Q signals towards a desired level (see abstract and col. 10, lines 19-35 and 37-49). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the invention adapt to include an amplitude detector for determining the amplitude of the output I signal and an amplitude detector for determining the amplitude of the output Q signal, and determining the difference between the amplitude of the output I and Q signals to bring the difference between the amplitudes of the output I and Q signals towards a desired level because this would allow for efficient adjustment of input signals provided for reducing the image response of the receiver.

Regarding claim 23 Ripley and Liu teach a device as recited in claim 4 and is rejected given the same reasoning as above.

Regarding claim 25 Ripley and Liu teach a device as recited in claim 6 and is rejected given the same reasoning as above.

Regarding claim 26 Ripley teaches changing the capacitance value and the resistance value (see col. 4, lines 36-42).

Regarding claim 28 Ripley teaches a device as recited in claim 22 except for a phase shifting network that is tuned by adjusting an RL time constant. Ripley does teach adjusting an RC time constant (see col. 4, lines 37-42) and changing resistive and capacitive elements (see col. 3, lines 18-21 and col. 5, lines 15-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the invention adapt to include a phase shifting network with inductive elements that is tuned by adjusting an RL time constant because this would allow improved image rejection capabilities of a phasing receiver.

Regarding claim 29 Ripley teaches a device as recited in claim 22 except for a phase shifting network that is tuned by adjusting an LC time constant. Ripley does teach adjusting an RC time constant (see col. 4, lines 37-42) and changing resistive and capacitive elements (see col. 3, lines 18-21 and col. 5, lines 15-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the invention adapt to include a phase shifting network with inductive elements that is tuned by adjusting an LC time constant because this would allow improved image rejection capabilities of a phasing receiver.

Regarding claim 30 Liu teaches detecting the amplitudes of I and Q signals (see abstract and col. 10, lines 29-33).

Regarding claim 31 Ripley teaches tuning a second phase shifting network located in an intermediate frequency path within the receiver, the tuning being performed according to the tuning signal determined for the first phase shifting network (see abstract, col. 1, lines 64-67, and col. 2, lines 1-8).

Regarding claim 32 Ripley and Liu teach a device as recited in claim 14 and is rejected given the same reasoning as above.

Regarding claim 33 Ripley and Liu teach a device as recited in claim 17 and is rejected given the same reasoning as above.

Regarding claim 34 Ripley teaches a tunable phase shifting network for use in an image reject circuit (see col. 5, lines 23-26). Ripley teaches a phase shifting network that has first and second input terminals for receiving an input signal and producing an output in-phase (I) signal and an output quadrature (Q) signal (see col. 5, lines 34-38). Ripley teaches a first phase shifting circuit connected between a first input terminal and a voltage reference and a second phase

shifting circuit connected between a voltage reference and a second input terminal (see col. 3, lines 24-26, 45-47 & 51-53). Ripley teaches containing a first and second parallel arms connected between the respective input terminal and the voltage reference; the first arm comprising a resistive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and capacitive element (see col. 3, lines 11-21 & 46-50). Ripley teaches a phase shifting network that is tuned by adjusting an RC time constant (see col. 4, lines 37-42). Ripley does not teach the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal. Liu teaches difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal (see abstract and col. 10, lines 29-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the invention adapt to include the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal because this would allow for efficient adjustment of input signals provided for reducing the image response of the receiver.

Regarding claim 35 Ripley and Liu teach a device as recited in claim 5 and is rejected given the same reasoning as above.

Regarding claim 36 Ripley and Liu teach a device as recited in claim 6 and is rejected given the same reasoning as above.

Regarding claim 39 Ripley teaches a tunable phase shifting network for use in an image reject circuit (see col. 5, lines 23-26). Ripley teaches a phase shifting network that has first and second input terminals for receiving an input signal and producing an output in-phase (I) signal

and an output quadrature (Q) signal (see col. 5, lines 34-38). Ripley teaches a first phase shifting circuit connected between a first input terminal and a voltage reference and a second phase shifting circuit connected between a voltage reference and a second input terminal (see col. 3, lines 24-26, 45-47 & 51-53). Ripley teaches containing a first and second parallel arms connected between the respective input terminal and the voltage reference; the first arm comprising a resistive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and capacitive element (see col. 3, lines 11-21 & 46-50). Ripley does not teach the first arm comprising a resistive element in series with an inductive element; the second arm comprising an inductive element connected in series with a resistive element; and, each I and Q output line being connected to respective junction between the series connected resistive element and inductive element, a phase shifting network that is tuned by adjusting the RL time constant, or the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal. Ripley does teach adjusting an RC time constant (see col. 4, lines 37-42) and changing resistive and capacitive elements (see col. 3, lines 18-21 and col. 5, lines 15-17). Liu teaches the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal (see abstract and col. 10, lines 29-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the invention adapt to include the first arm comprising a resistive element in series with an inductive element; the second arm comprising an inductive element connected in series with a resistive element; and, each I and Q output line being connected to respective junction between the series connected

resistive element and inductive element, a phase shifting network that is tuned by adjusting the RL time constant, and the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal because this would allow for efficient adjustment of input signals provided for reducing the image response of the receiver.

Regarding claim 40 Ripley teaches a tunable phase shifting network for use in an image reject circuit (see col. 5, lines 23-26). Ripley teaches a phase shifting network that has first and second input terminals for receiving an input signal (see col. 5, lines 34-38). Ripley teaches a first phase shifting circuit connected between a first input terminal and a voltage reference and a second phase shifting circuit connected between a voltage reference and a second input terminal (see col. 3, lines 24-26, 45-47 & 51-53). Ripley teaches a first and second parallel arms connected between the respective input terminal and the voltage reference; the first arm comprising a resistive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and capacitive element (see col. 3, lines 11-21 & 46-50). Ripley does not teach the first arm comprising an inductive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with an inductive element; and, each I and Q output line being connected to a respective junction between the series connected inductive element and capacitive element, a phase shifting network that is tuned by adjusting the LC time constant, or the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal. Ripley does teach adjusting an RC time constant (see col. 4, lines 37-42) and changing resistive and capacitive elements (see col. 3, lines 18-21 and col. 5, lines

15-17). Liu teaches the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal (see abstract and col. 10, lines 29-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the invention adapt to include the first arm comprising an inductive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with an inductive element; and, each I and Q output line being connected to a respective junction between the series connected inductive element and capacitive element, a phase shifting network that is tuned by adjusting the LC time constant, and the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal because this would allow for efficient adjustment of input signals provided for reducing the image response of the receiver.

Claims 5, 11, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ripley in view of Liu and Moore.

Regarding claim 5 Ripley and Liu teach a device as recited in claim 4 except for a capacitive element that comprises a reverse polarity junction diode, which is tuned in accordance with a tuning signal. Moore teaches a reverse polarity junction diode, which is tuned in accordance with a tuning signal (see pg. 7, lines 5-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the invention adapt to include a reverse polarity junction diode, which is tuned in accordance with a tuning signal because this would allow improved image rejection capabilities of a phasing receiver.

Regarding claim 11 Ripley teaches an input terminal for receiving an input signal (see col. 1, lines 62-66). Ripley teaches a resistor connected between an input terminal and an output terminal; and a capacitor connected between an output terminal and ground (see col. 3, lines 11-

15 and FIG. 2). Ripley does not teach a resistor and a forward polarity diode connected between the input terminal and an output terminal; and, a capacitor connected between the output terminal and ground. Moore teaches a resistor and a forward polarity diode connected between an input terminal and an output terminal (see col. 7, lines 5-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include a resistor and a forward polarity diode connected between the input terminal and an output terminal; and, a capacitor connected between the output terminal and ground because this would allow for improved image rejection capabilities of a phasing receiver.

Regarding claim 24 Ripley and Liu teach a device as recited in claim 22 except for changing the voltage across junction diodes, causing the capacitance of the junction diodes to change accordingly. Moore teaches changing the voltage across junction diodes, causing the capacitance of the junction diodes to change accordingly (see pg. 7, lines 5-7 & 10-11). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include changing the voltage across junction diodes, causing the capacitance of the junction diodes to change accordingly because this would allow for improved image rejection capabilities of a phasing receiver.

Claims 8, 16, 18-20, 27, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ripley in view of Liu and Mole.

Regarding claim 8 Ripley and Liu teaches a device as recited in claim 6 except for a MOFSET operated in its triode region. Mole teaches transistors operating in their triode region (see col. 12, lines 15-18 & 21-25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the invention adapt to include a MOFSET operated

in its triode region because this would allow for reduction in the impact of image frequencies generated by mixing.

Regarding claim 16 Ripley and Liu teach a device as recited in claim 15 except for an RC poly-phase filter section for removing any residual difference between the amplitudes of the I and Q signals. Mole teaches an RC poly-phase filter (see abstract and col. 4, lines 9-12). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include an RC poly-phase filter section for removing any residual difference between the amplitudes of the I and Q signals because this would allow for a desired amplitude value to be set.

Regarding claim 18 Mole teaches bipolar technology (see col. 8, lines 42-44).

Regarding claim 19 Mole teaches circuitry that is implemented in CMOS, BiCMOS, SiGe or GaAs technology (see col. 13, lines 35-38).

Regarding claim 20 Mole teaches an integrated circuit (see col. 3, lines 65-67 and col. 4, lines 1-2).

Regarding claim 27 Ripley, Liu, and Mole teach a device as recited in claim 8 and is rejected given the same reasoning as above.

Regarding claim 38 Ripley, Liu, and Mole teach a device as recited in claim 8 and is rejected given the same reasoning as above.

***Response to Arguments***

Applicant's arguments with respect to claims 1-6, 8-36, and 38-40 have been considered but are moot in view of the new ground(s) of rejection.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Abbasi et al. U.S Patent No. 6,397,051 discloses dual image-reject mixer receiver for multiple channel reception and processing.

Sokoler U.S Patent No. 6,073,001 discloses down conversion mixer.

Ben-Efraim et al. U.S Patent No. 5,812,927 discloses a system and method for correction of I/Q angular error in a satellite receiver.

Weinert U.S Patent No. 5,067,140 discloses conversion of an analog signal into I and Q digital signals with enhanced image rejection.

Lovelace et al. U.S Patent No. 6,137,999 discloses an image reject transceiver and method of rejecting an image.

McGeehan et al. U.S Patent No. 5,950,119 discloses image-reject mixers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandon J. Miller whose telephone number is 571-272-7869. The examiner can normally be reached on Mon.-Fri. 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on 571-272-7872. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

June 29, 2005

WILLIAM TROST
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600